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TWO CASES OF OPERATION FOR TRAUMATIC EPILEPSY; IN ONE OF WHICH THE LATERAL VENTRICLE WAS WIDELY OPENED; IN THE OTHER, AN ABSCESS OF THE BRAIN, CAUSED BY A PORTION OF BONE BEING EMBEDDED IN THE BRAIN FOR FOURTEEN MONTHS, WAS EVACUATED.

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Case I. *Traumatic epilepsy; wide opening of the lateral ventricle; recovery; recurrence of epilepsy.*—R. S., aged nineteen years, from Cadwallader, Fayette County, Pennsylvania, was admitted to the Jefferson Medical College Hospital, April 14, 1901, at the instance of his physician, Dr. Eustan. His father died after an operation for stone in the bladder; his mother and three brothers and sisters are living and well. He had measles and whooping-cough in childhood and diphtheria in March, 1901. In 1892 he was thrown from a horse, striking on the right side of his head over the occipital and posterior portions of the parietal bones. There was a large lacerated wound of the scalp. The bone was fractured and some of it removed. One year later a piece of necrosed bone was discharged. He is said to have been unconscious for nine days, but when he recovered consciousness there was no paralysis either of motion or of sensation. Seven years later, in March, 1899, he had his first epileptic convulsion (*grand mal*). He has had a number of attacks since then. They are preceded by an aura in which his entire head seems to become filled with blood. In addition to these attacks of *grand mal* he has had very many more of *petit mal.* During the attacks he says that his head always turns toward the left. The convulsions, however, do not begin in any one part of the body, but are universal. In the two years since the first attack he has had about fifteen severe ones in addition to a large number of slighter ones. The last attack was three months ago.

The examination of the eyes, by Prof. de Schweinitz, was negative. The urine was clear, of amber color, specific gravity 1024, reaction acid, urea 1.8 per cent. It contained no albumin or sugar. The microscope showed amorphous urates, a few epithelial cells, and a few leucocytes.

In view of the fact that nothing was done at the time of injury excepting to remove a piece of loose bone, and of the relatively recent beginning of the attacks of epilepsy, after consultation with Prof. Dercum I decided to do an exploratory operation.

Operation, April 17, 1901. I first turned down a large flap of scalp with the periosteum and exposed two openings in the skull, the larger one of which (3 x 1.5 cm.) I had already recognized through the scalp. The smaller one was one-quarter the size of the first. I first removed the bridge of bone between the two openings and enlarged the entire opening by the rongeur forceps until it was 10 cm. long by 3.5 cm. wide, the long axis being antero-posterior. I then divided the dura, which was thin. Immediately below it in some loose connective tissue ran a vessel of considerable size, which from its situation and direction I judged was the posterior branch of the middle meningeal. This was tied with two catgut ligatures and cut. Below the dura and connected with it by some trabeculæ of loose fibres of connective tissue, and at a depth of about 1 cm. below the dura, was a thin, dark-colored sac, apparently the wall of a cyst. On opening this a considerable amount of fluid (probably several ounces) escaped. I doubled a bit of silkworm-gut like a hairpin, and by this means measured the cavity, finding that I could introduce the silkworm-gut for a distance of 10 cm. I then enlarged the opening in the supposed cyst in order to inspect the character of the wall lining it, and, quite to my astonishment, found that I had opened widely the lateral ventricle, the fornix, and choroid plexus, and the cornua in the floor of the ventricle, all being in full view. I was very naturally astonished, because I had not thus far seen anything of the cerebral cortex, much less any white matter under the gray. Though I had often punctured the lateral ventricle, I confess that when I was confronted by a widely opened ventricle I was very much perplexed how to deal with it. I finally decided, as there would be considerable oozing of blood into the ventricle, that it would be wiser to drain for a time, and accordingly I first inserted a small rubber drainage-tube, and alongside of it a gauze wick, with instructions to the house surgeon, Dr. Jiminez, to remove the rubber tube in four or five hours. The gauze I intended to remove the next day, but he was directed, in case of any serious symptoms arising in the interval, to remove all drainage at once and close the wound. I was rather surprised to find that the escape of so large an amount of cerebro-spinal fluid did not produce any symptom whatever. After my clinic was over, though no symptoms had arisen, I decided that it would be wiser to remove the drainage-tube immediately, as I was afraid of the continuous escape of the cerebro-spinal fluid. Accordingly, after the tube had been in place two hours, the house surgeon removed it. The iodoform gauze I removed the next day. As soon as the gauze was removed there was a jet of bloody fluid which spurted to a distance of perhaps 20 or 25 cm.; in all I estimated that between four and six ounces of fluid were lost before I could check it by pressure. My fear was that, as in a case of hydrocephalus, the loss of cerebro-spinal fluid would probably cause convulsions which might possibly even prove fatal. Nothing, however, occurred; even his pulse rate did not change.

On the sixth day after the operation, finding the flap bulging a good deal and the patient complaining of severe headache, I evacuated two or three ounces of cerebro-spinal fluid by means of a pair of forceps slipped under the flap. The fluid this time was almost entirely clear. On the seventh day he was up and out of bed. The wound required no further interference and healed by primary union. His temperature on the day after operation rose to 102.4°, and the next morning to 103°. It then fluctuated between 101° and 102° until the eleventh day, when it was down to the normal and remained so. After the evacuation of the fluid on the sixth day his headache disappeared. On May 7th, the twentieth day, the severe headache returned, and he was markedly drowsy, without, however, any bulging of the flap to indicate any increased intracranial pressure. At 4 A.M. of May 8th, and again at 11.45 A.M. and 12.10 P.M., he had three severe epileptic attacks, during which the entire body was scarlet. The hands and arms showed marked convulsive movement more than any other part of the body. On May 10th he left the hospital for his home in excellent physical condition. He had had no later epileptic attacks up to May 24th.

REMARKS. In an elaborate paper presented at the International Medical Congress in Berlin, in 1890, but of which only a résumé was read and published, I collected all the cases then recorded in which the lateral ventricle had been opened. Unfortunately, although I handed it in person to the secretary of the surgical section, it was lost, and I had no copy. I have never been able to spare the time to rewrite it. At the time I was greatly surprised to find that that which had usually been considered a fatal accident was, relatively speaking, harmless.

Before the operation upon the present case, I had already opened, in other cases, the ventricles upon both sides and irrigated the brain from side to side, drained the ventricles for a short time, and punctured them to relieve intracranial pressure a number of times, but I had never laid it widely open, almost as widely as one opens a box by removing the lid. Hence, I was in no little perplexity to know just what to do in this case. The result would seem to prove that I decided rightly, viz., to drain for a time and then to close the wound. I was surprised to see how little effect, in fact I might say no effect, was produced by the escape of so large a quantity of the cerebro-spinal fluid. Whether an adult is less susceptible than a child and a relatively normal person than a hydrocephalic, I do not know, but certainly in this case the escape of the fluid was absolutely without result, saving that which was beneficial in relieving the severe headache.

The cause of the very unusual condition which was found in the brain is quite obscure to me. There was absolutely no cortex and no white substance between the posterior half of the lateral ventricle and the membranes. I use the pleural because I suppose that the thin sac, which was 1 cm. inside the dura, was probably the pia. The space between the dura and the pia was occupied by the trabeculæ of connective tissue in the shape of thin threads, in the meshes of which was considerable cerebro-spinal fluid.

Whether the case was one of acquired porencephaly or whether there was simply destruction of the cerebral tissue between the ventricle and the dura at the time of the accident, or by absorption later, I cannot guess. The young man's mental condition when he entered and when he left the hospital was entirely normal. There was no paralysis, and, moreover, in spite of the extensive and deep destruction of the brain tissue there was no hemianopsia. From the operative point of view his recovery was very gratifying. The brief later history would seem to show that probably there will be no benefit so far as the epilepsy is concerned.

CASE II. *Gunshot wound of the head followed by hemiplegia, traumatic epilepsy and abscess of the brain, due to the embedding of a portion of the bone in the brain for fourteen months.*—H. M. L., aged twenty-one years, of Pittston, Pennsylvania, was admitted to the Jefferson Medical College Hospital, March 24, 1901. His family and personal history have no bearing on the case. He was a private in the Eighth United States Cavalry in Cuba. In February, 1900, while acting as a marker at target practice, he was struck in the head, on the right side of the vertex, by the ball from a Krag-Jorgensen rifle. The ball passed completely through the head, emerging on the other side, and must have passed either directly through or immediately below the superior longitudinal sinus. Possibly the ball passed just above the sinus, destroying the bone, but this seems to be a less likely probability. He remained unconscious for six weeks, at which time his epilepsy began. This was most marked on the left side of the body, including the face, the attacks recurring every three or four weeks. He was not unconscious during the attacks. At the end of March, 1900, an operation was done, a portion of bone being removed. Later, at Santiago, a second operation was done, and a piece of bone inserted to close the opening. In November, 1900, he returned to the United States. His general condition was much improved, and he was able to walk, although the left side of the body was very weak. The epileptic attacks now began to increase in frequency, occurring as often as every six or eight days. They were accompanied with intense pain in the left leg and arm, both of which extremities became markedly weak. In addition to this he suffered from almost constant pain in the back of his head. On January 16, 1901, he was operated on for a third time, the plate of bone being then removed. Since this operation only one epileptic attack has occurred, although he has had threatenings of several. The pain in the back of his head and the paralysis of the left side were not relieved.

On admission his general condition was only fair, his appetite was poor, and the bowels constipated. The left leg and arm and the left side of the face were paralyzed, accompanied by a spastic condition of the parts involved, evidently due to a lesion of the motor area. Prof. Dercum examined him on March 27th, confirmed the observations made, and noted also that there was no Babinski reflex; that the knee-jerk on the right side was slightly exaggerated; that there was no sensory loss. He concurred with me as to the desirability of an exploratory operation. The urine was turbid, amber color, specific gravity 1022, reaction acid, with a slight trace of albumin, no sugar, urea 1.3 per cent. The microscope showed calcium phosphates, amorphous urates, and a few leucocytes; no blood or casts. On admission he was unable to walk, but mentally was fairly clear. From day to day, however, he became more and more somnolent. The temperature, which had risen considerably, had almost immediately fallen to a little below the normal, and remained there. Moreover, his headache and his epilepsy were increasing in severity. It seemed, therefore, probable that there was a cerebral abscess and that immediate operation should be done. The opening in the top of his skull was 5 x 3 cm., about two-thirds of it being to the right of the middle line, the axis of the opening being almost directly transverse. The superior longitudinal sinus would be a little to the left of its middle and at right angles to its axis. On March 25th Dr. de Schweinitz examined his eyes, with the following results:

O. D., pupil reactions normal, nearly round disk. A spot of white tissue on the nasal side, probably congenital; fundus in good condition. O. S., a similar condition, and disk slightly congested. He has a history of having had diplopia, but at present there is neither paralysis of the ocular muscles nor hemianopsia.

Operation, March 30th. I made a large horseshoe-shaped flap on the right side, the highest point of the curve being just to the left of the middle line. Without much difficulty I dissected away the flap from the dura. As soon as the dura was exposed it bulged very distinctly through the opening. Through the dura a hard mass about the size of the last joint of the finger was felt, about the nature of which I was very uncertain. I then enlarged the opening in the bone about 1 cm., opened the dura parallel with the bone, and turned back the flap, the base of the flap in the dura being toward the middle line, so as not by any accident to open the sinus or the parasinoidal spaces. The hard mass above referred to, which was now found to be about 2.5 cm. in diameter, lay in the brain just at the upper end of the fissure of Rolando. On incising the mass to discover its character the knife impinged on a hard, rough substance which I judged to be possibly a portion of the ball, but more likely a piece of bone. I then was able, partly with my finger and partly with a scoop, to remove the entire mass, finding it to be 4 cm. in depth. On laying it open a fragment of bone, rather less than the size of the last joint of my forefinger, was found in its interior, the hard mass being made up partly of the bone and partly of the hard fibrous tissue in which it was encysted. On inspecting the bone one side of it showed the serrations of the sagittal suture; evidently it had been driven into the brain at the time of the accident, in February, 1900, and had remained embedded in the bone nearly fourteen months. At the bottom of the cavity left by the removal of the bone and its surrounding tissue, I evacuated an abscess which contained about one-half ounce of pus. From the surface of the brain to the bottom of the abscess was 7 cm. Although I feared from the position and depth of this cavity that it communicated with the lateral ventricle, I could not establish the fact, and think that the ventricle most probably escaped. After washing out the cavity with normal salt solution I packed a little iodoform gauze into it, and in closing the wound led the gauze out obliquely under the flap instead of making an opening in the flap directly over the gauze, my object being to avoid, if possible, a fundus cerebri by the oblique drainage.

After the operation the temperature usually fluctuated between 97° and 99°. The packing was removed on the second day, and a small bit of gauze inserted again obliquely for 2.5 cm. under the flap. This was removed on the fourth day. On April 10th, the eleventh day, the temperature suddenly rose to 100°. A pair of forceps was inserted under the flap evacuating a few drops of pus, when the temperature again fell to between 97° and 98°. On April 14th, the fifteenth day, the temperature again rose to 101.4°. After the evacuation of a few drops of pus the temperature again fell to between 97° and 98°, which seemed to be possibly his usual temperature. He went home on May 8th. Four days after the operation he could move his left leg, and about the same time motion returned in the left arm. His use of these extremities steadily gained, so that on April 20th, the twenty-first day, he was out of bed and could walk quite well, although the left ankle was still weak. When discharged, on May 8th, the wound had been entirely well for a number of days. He occasionally suffered from moderate, but never from severe, headache. His general health was perfect, both physically and mentally, although for several days after the operation he had been almost entirely unconscious.

REMARKS. Perhaps the only remarks necessary in this case are to point out the fact that at three operations by some accident the portion of bone embedded in the brain tissue had not been discovered; that it had produced an abscess over a year after the accident is also noteworthy; and that it was not a bit of the bone plate inserted at one of the operations, but was a portion of the original bone driven into the brain at the time of the accident was proved by the serrations of the sagittal suture. It is entirely too early to predict anything as to his epilepsy.

PRIMARY TUBERCULOSIS OF THE PERICARDIUM.*

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TUBERCULOSIS of the pericardium presents itself (*a*) in the form of scattered miliary tubercles; (*b*) as a tuberculous infiltration, with great thickening of the pericardial layers; or (*c*) as a serous, serofibrinous, purulent, or hemorrhagic pericarditis. In miliary tuberculosis the nodules are found most plentifully near the base of the heart, or on the parts reflected upon the great vessels. The process is, as a rule, merely an incident in a general tuberculosis, and possesses no clinical importance. The tuberculous infiltration is either associated with abundant serofibrinous exudation or with more or less extensive cohesion of the pericardial surfaces, and not infrequently with great thickening of the layers and complete obliteration of the sac. The heart then looks as if ensheathed in a cuirass (Merklen[1]). On cursory, naked-eye examination the appearances are often not in the least characteristic of tuberculosis. Sometimes, if the process is recent, a careful separation of the layers may reveal here and there miliary tubercles or larger cheesy conglomerates; but in old cases of pericardial symphysis the familiar picture of tuberculosis may be so completely obliterated that the most careful

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* A paper, somewhat amplified, read before the Pathological Society of Philadelphia, December 27, 1900.